

Usability on TV

Innovative User Interfaces Depicted in Current TV Series and their Potential to Inspire Actual Interfaces

Yang Zhong¹ and Monique Janneck²

¹Digital Media, University of Bremen, Bremen, Germany

²Electrical Engineering and Computer Science, Luebeck University of Applied Sciences, Luebeck, Germany

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Abstract: Current television series, especially those revolving around or dealing with information technology or technical issues in general, often depict interesting ideas for user interfaces or interaction techniques. Especially, user interfaces are often shown to be very intuitive and easy to use: Frequently protagonists use unknown interactive systems without prior training and are able to conduct complex operations with the system. This paper analyzes user interfaces and interaction techniques depicted in “CSI: Miami”, a widely known US TV show. Possibilities and potentials to inspire actual user interfaces are explored.

1 INTRODUCTION

Everyday millions of people get in touch with the most sophisticated and stunning technology, amazing, efficient, and easy-to-use interfaces and novel interaction techniques—but not at work or while using their private computers or electronic devices, but sitting in front of the TV watching current TV shows such as the “CSI: Crime Scene Investigation” series. Such fictional works often depict interesting ideas for user interfaces or interaction techniques. Especially, user interfaces are often shown to be very intuitive and easy to use: Frequently protagonists use unknown interactive systems without prior training and are able to conduct complex operations with the system. So we asked ourselves: Could we as designers of interactive systems learn something from watching Usability on TV? Could these fictional technologies inspire actual interfaces? Do they conform to design principles from usability research or do they just use bogus show effects that would not be practical in reality?

In this paper we take a closer look at innovative user interfaces depicted in the well-known US TV series “CSI: Miami”. As a basis for our analysis we used the following main areas of interaction design (cf. Shneiderman and Plaisant 2010, Rogers et al., 2011, Heim 2008): *Metaphors and mental models*,

direct manipulation, user control, menu design, and information search.

2 ANALYSIS

The users of CSI interfaces systems are all well-trained experts. Therefore, from an interaction design point of view, the systems depicted in “CSI: Miami” were designed for expert users. However, likewise, they are designed to attract the audience by showing advanced, stylish, and fun-to-use technology.

Generally, regarding the presentation and aesthetics of the interfaces shown in “CSI: Miami” it can be remarked that dark colours are widely used as a background, while text and graphical elements are usually brightly coloured. Quite interestingly, this use of colour resembles early command-line interfaces rather than modern GUIs. Furthermore, this kind of colour use seems rather questionable from an ergonomic point of view. However, this kind of presentation is presumably used to make it easier for the audience to detect the information presented on the screen while sitting in front of the TV.

2.1 Metaphors and Mental Models

Command languages are widely used because the expert users are comfortable operating with complicated command languages. However, some metaphors can still be found in the series.



Figure 1: Interface of DNA identification.

In the DNA analysis interface shown in Figure 1, the interface displays a mixture of changing colourful bars when the DNA sample is being checked. It provides a direct impression of the DNA identification process while waiting for the results. Additionally, the metaphor conveys the idea of each DNA item being checked and compared with the DNA database. Such metaphors establish the connection between human lab work and automatic DNA identification done by the computer. It can be seen as a way to establish user trust in autonomous systems.

2.2 Direct Manipulation

In “CSI: Miami” direct manipulation is widely used to support the scientists to investigate evidence such as fingerprints, DNA samples, soil samples etc. As an innovative display, a multi-touch table together with a huge monitor helps the scientists to analyze the current case.

In the example shown in Figure 2, the investigators simply place a mobile phone on the multi-touch table and the contents of the storage chip are automatically displayed on the table, which also functions as a monitor. SMS and pictures stored on the mobile phone are displayed as icons so that the officers can check them by touching and clicking on the desk. Users can zoom in and out the pictures and read specific SMS by selecting it with their fingers.

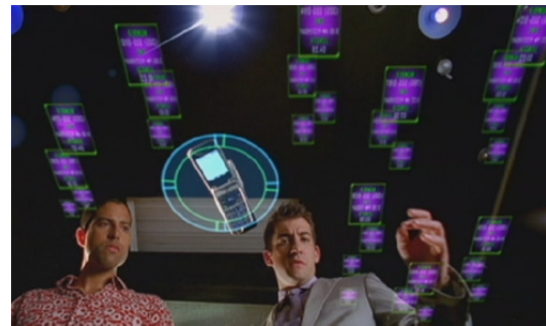


Figure 2: The multi-touch desk interface.

In the interface shown in Figure 3, an agent uses a pen to draw the possible escape route of a criminal. In this case, direct manipulation is realized through a pointing device instead of multi-touch screen. This resembles real-life applications in which pointing devices are known to be more precise than touch gestures: Drawing the track by fingers won't be precise enough for calculating and navigation. Since in this case precision is important for the investigation, this can be considered as a hint that the designers of the fictional displays nevertheless aimed for realistic designs. In real life, professional digital artists also mostly use a professional drawing pad together with a capacitive pen. Furthermore, the pen device symbolizes the traditional drawing action and therefore is more easily accepted by the users as well as the audience.



Figure 3: Virtual spatial interface.

2.3 User Control

The underlying principle of user control design is to offer users what they need while protecting them from making risky and irreversible operations.

In “CSI: Miami”, the systems mostly allow users to make changes and requests freely. This seems appropriate as expert users like the investigators are

very familiar with the systems and know how to get satisfying results. Thus, the system serves as an assistant that offers adequate information according to the user's request.



Figure 4: Image processing interface.

An example of applying user control is the image-processing interface shown in Figure 4. In one episode, the suspect successfully hides the evidence, giving the investigators a hard time. Therefore photographs taken by the suspect are inspected several times to find any possible evidence. The image processing system allows users to enlarge the picture, overview the gallery, and analyse the picture due to different instructions. Users control the image processing system, which detects the appropriate filter and analysis strategy. In this crime case, users filter the reflection on the car taillight and enlarge the picture. After the image is processed the eye of victim is discovered. But without the user's notice and direction, this evidence would have remained uncovered. In a word, users take control of the decision-making procedure and the system executes users' instructions.

2.4 Menu Design

Using familiar terminology and suitable structure is important for menu design. In the interface shown in Figure 5, reported crime logs are stored in a database, which can be looked up by date or searched for certain logs. In order to support users to work more effectively, task-related menu organization is applied here. Distinctive and comprehensible menu categories are listed in the left side so that users can make selections confidently and know clearly what will happen afterwards.

Often hierarchical decompositions are applied in menu organization because it is a natural and

comprehensible structure. Furthermore, every item is categorized into one group according to its characteristics.

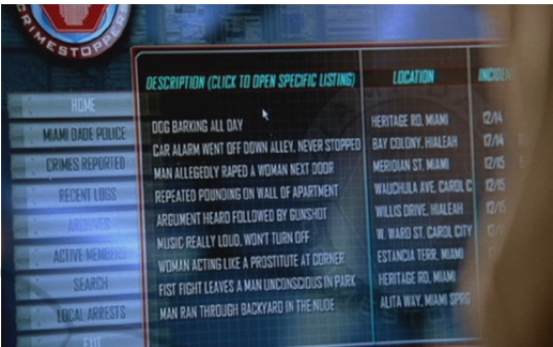


Figure 5: Miami Dade Log interface.

Unlike these principles, in the car license search interface depicted in Figure 6 the search results are displayed distributed across the screen, with the agent simply grasping the appropriate information.



Figure 6: Interface of car license search.

This strategy seems questionable since large quantities of information might cause severe problems with this kind of display. It is difficult for users to leave out the unwanted information and get straight to the required object. A simple list of results would probably enable users to filter the information more efficiently than a scattered map of matches. So in this case, the design can rather be seen as a treat to the audience than actually serving with a certain purpose.

2.5 Information Search

Information search is one of the most important tasks performed in "CSI: Miami" because of the numerous suspect profiles and related information libraries. Powerful search methods are needed and smooth technology is used to support the task.



Figure 7: Flight search interface.

In the interface shown in Figure 7, natural language is taken as a search language instead of short keyword search or Structured Query Language (SQL). This is an example of sophisticated search techniques that are not yet working successfully in real-life systems.

3 CONCLUSIONS

In our view, the interaction styles and interface designs presented in movies and TV series such as “CSI: Miami” definitively deserve interface designers’ attention. The analysis shows that the fictional user interfaces depicted in a TV series like “CSI: Miami” conform to quite a great extent with actual interface design principles, and that guidelines are mostly applied in a sensible way. Nevertheless they incorporate some innovative ideas that might inspire actual interfaces, such as well organized and task-related but yet aesthetically appealing and easy-to-scan menus. Furthermore, as most interface elements are quite large (much larger than one would expect on a regular desktop screen) in order to make them readable for a TV audience these displays might inspire designers of smartphones and other mobile device applications, where display space is usually limited.

As for hardware design, multi-touch and also multi-use panels and tables are maybe the most spectacular devices shown in “CSI: Miami”. However, systems like these are already available, such as Smartboards or the Microsoft Pixsense tables. Regarding these technologies, “CSI: Miami” does not show hardware innovations but rather examples for innovative use cases for these systems, such as creative teamwork in complex problem solving tasks. Furthermore, it shows that the strengths of these systems would be to integrate a lot of information from various sources and also

different applications.

Surprisingly few interfaces can be deemed as outright unrealistic: Among them are some fancy graphical displays and effects that in real life would probably rather annoy users, and also the use of natural language which has a long tradition in computer science research but still mostly falls short of expectations in current implementations.

In our view analysing fictional displays like those shown on TV is worth further research activities. More detailed analyses could be done for specific areas, e.g. menu design or visualization techniques. Contemporary series or movies like “CSI: Miami” are especially suitable since they are situated in the beginning of the 21st century and do not display mere science fiction. Furthermore, other artwork and also written novels might be interesting material to explore.

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